

Rail-Highway Crossing Safety Projects

Rail-Highway crossing safety projects are primarily funded using Federal Highway Administration (FHWA) Surface Transportation Program (STP) Safety funds. These funds are about one-half of the ten percent of STP funds that must be set aside for constructing safety projects under Title 23 United States Code (U.S.C.) Section 130. The rail-highway crossing safety projects program is administered/coordinated by the Multimodal Operations Division of MoDOT.

State Grade Crossing Safety Fund

The Missouri legislature created a State Grade Crossing Safety Funds Account supported by a tax on motor vehicle licensing. This fund, created to upgrade the safety of existing rail-highway crossings, is used to provide the 20 percent matching funds for the program. The total amount contributed yearly by this state fund is approximately \$1.0 million. It is administered by the Missouri Department of Economic Development's Motor Carrier And Railroad Safety Division (DED/MCRS).

Rail-Highway Crossings Safety Program

Overall Purpose- Overall purpose of this program is to improve safety at rail-highway grade crossings to both railroads and highway users. Under this program, projects to improve crossing safety generally are funded at 80 percent federal and 20 percent state of the total cost. Project improvements typically done are to install railroad crossing signal devices, circuitry, and surfaces depending on the diagnostic review recommendations. Projects can also provide improvements on adjacent highway approaches to primarily yield better sight distance toward crossings or install barricades for closures.

Diagnostic Reviews and Procedures- A Joint Diagnostic Team performs yearly reviews on eligible rail-highway crossings. A diagnostic team consists of one MoDOT representative, a member of the Department of Economic Development Motor Carrier And Railroad Safety Division, one or more railroad representatives and one or more members of a local public works agency, county and/or city. This team evaluates the crossing to determine the best solution to improve safety at railroad crossings. Setting of statewide priorities for projects utilizing this funding uses a measure called an "Exposure Index" (EI) which involves a number of factors, including the volume of vehicles and of trains, vehicular and train speeds, and sight distance. A brief explanation of how the Exposure Index is computed is given at the end of this section. An accident study may also be performed to see if signal improvements are warranted.

Program General Schedule- A general schedule for programming, development and implementation of rail-highway improvement projects is as follows. This schedule usually involves four phases over a three-year period.

***Rail-Highway Crossing Safety Projects
General Schedule By Phase***

I. Programming (*About seven months duration*)

1. Missouri Department of Economic Development/Division of Motor Carrier And Railroad Safety (DED/MCRS) and Missouri Department of Transportation (MoDOT) sets criteria and develops a priority list by March 1.
2. Diagnostic field reviews completed by June 1.
3. MoDOT and DED/MCRS develops project list by June 15.
4. MoDOT submits urban project list of crossing improvements to Metropolitan Planning Organizations.
5. Rural project list is submitted to the MoDOT Office of Transportation Program Management for listing on State Transportation Improvement Program (STIP).
6. MoDOT obligates federal funds with Federal Highway Administration (FHWA) when funds are available (usually October 1).

II. Preliminary Engineering and Agreement Processing (*About seven months duration*)

1. MoDOT sends an agreement for installation of warning devices to the railroad with a copy of the diagnostic form, and MoDOT authorizes the railroad to perform engineering (15 days after obligation).
2. Railroad returns agreement with plan and estimate. Copies are sent to DED/MCRS with plan and estimate (time limit: 120 calendar days from preliminary engineering date).
3. MoDOT and DED/MCRS review plan and estimate.

***Rail-Highway Crossing Safety Projects
General Schedule By Phase (Cont.)***

4. MoDOT sends agreement to local agency (if crossing is on a state route, skip to Step 6).
5. Local agency executes agreement and returns to MoDOT (time limit: 30 days).
6. MoDOT executes agreement and distributes fully executed agreements.
7. DED/MCRS staff files application with DED/MCRS administrative law judge (ALJ), (15 days).
8. All parties respond to application and waive oral hearing if project is acceptable.
9. DED/MCRS ALJ issues order to install devices (30 days).

III. Construction and Inspection (*About 12 months duration*)

1. MoDOT authorizes the railroad to order material and proceed with construction (5 days).
2. Railroad notifies MoDOT district construction engineer five days prior to beginning field work.
3. Railroad installs warning devices. MoDOT inspects work during installation.
4. DED/MCRS performs final inspections within 90 days after project completion.

IV. Billing (*About 10 months duration*)

1. Railroad transmits bill to MoDOT and DED/MCRS within 8 months after project completion.
2. DED/MCRS audits and issues payment from State Grade Crossing Safety Account (60 days).
3. MoDOT issues payment within 60 days after receiving bill and audits at a later date.

V. Summary: Total Project Duration

Average typical project total elapsed time from Programming through Billing, final payment is three years.

General Project Funding Policy And Priority- Usually projects are funded at a 80 percent federal and a 20 percent state funding ratio. However, as noted below, financial arrangements between responsible parties depends on type of required improvement.

Rail/Highway Crossing Safety Projects General FUNDING POLICY AND PRIORITY for Improvements

1. Passive To Active Warning Devices (*Exposure Index (EI) > 1000*)

80 Percent FEDERAL Highway Administration (FHWA) Surface Transportation Program (STP) Safety Funds
20 Percent Missouri Department of Economic Development/Division of Motor Carrier
and Railroad Safety (DED/MCRS) Grade Crossing Safety Account

2. Upgrades Due To Closures

Funding To Be Negotiated

3. Device Upgrades (*Exposure Index (EI) > 5000*) And Five Years Old

Funding To Be Negotiated

4. Passive Corridor Improvements

80 Percent Material FHWA STP Safety
20 Percent Material DED/MCRS Grade CROSSING SAFETY ACCOUNT
100 Percent Labor Railroad

5. Upgrade Due To High Accident Studies

(Study Performed On Crossings With Three Accidents In Five Years)
Funding To Be Negotiated

6. Circuitry Upgrades (*Exposure Index (EI) > 5000*) And 10 Years Old

Funding To Be Negotiated

7. Signal Enhancemet Program

Funding To Be Negotiated

8. Surface Improvements

Funding To Be Negotiated

Note: Policy and Priority Items Last Revised November 24, 1999

Rail/Highway Crossing Improvement Project Lists

Results of the various joint reviews and studies are given in the following four lists of rail/highway crossing improvements within Missouri Department of Transportation District. These are the projects which were selected for funding under this program both for the present year and previous years. The lists also provide an indication of project status. What each list represents is defined as follows.

List 1 - Projects where the agreements have been executed and an order for the improvements has been issued. The order gives the railroad companies one (1) year for the installation.

List 2 - Projects that were funded in Fiscal Year 1998 STIP, or a previous year, but the final design is not complete. These projects will be ordered within the next year.

List 3 - Projects that were funded in Fiscal Year 1998 which are still in the Preliminary Design Phase.

List 4 - Projects that were funded in Fiscal Year 1999.

List 5 - Additional projects to be funded in Fiscal Year 2000.

Rail/Highway crossing improvement projects located in one of the six Missouri Metropolitan Areas of Columbia, Joplin, Kansas City, St. Joseph, St. Louis and Springfield will be also listed in the respective Metropolitan Area Transportation Improvement Programs (TIPs) either by year and project or a line-item amount by year. The metropolitan area TIPs are incorporated into this Statewide Transportation Improvement Program (STIP) by reference as each TIP is a separate document.

Estimated federal funding for Fiscal Years 1999 and 2000 is tentatively set at \$3,980,000 each.

A general summary of the five (5) lists in terms of number of projects and amounts programmed is as follows.

<u>Description of List</u>	<u>Projects</u>	<u>Total Amount</u>
List 1: Projects Ordered for Construction (Implementation within 12 months by Railroads)	86	\$8,276,000
List 2: Projects in the Design Phase (Anticipated Implementation In FY 2001)	22	\$2,262,000
List 3: Projects in the Preliminary Design Phase (Anticipated Implementation in FY 2002)	51	\$4,855,000
List 4: Projects Programmed in FY 1999 (Anticipated Implementation in FY 2003)	44	\$3,900,000
List 5: Additional Projects to be Funded in FY 2000 (Anticipated Implementation in FY 2004)	39	\$5,070,000
Total	<u>242</u>	<u>\$24,363,000</u>

Also following the list of projects are (1) Railroad Glossary, (2) Improvement Type Definitions and (3) Exposure Index Computation.

List 1: Rail-Highway Crossing Projects In The Construction Phase Implementation Ordered

County	RR	Crossings	MPO	District 1: City	Roadway	Improvement	Estimate
No projects in the construction phase.							

County	RR	Crossings	MPO	District 2: City	Roadway	Improvement	Estimate
Carroll	BNSF	005321Y		Norborne	Walnut St.	Close Crossing	\$150,000
Carroll	BNSF	005322F		Norborne	Route D/Pine St.	Circuitry Upgrade	\$100,000
Carroll	BNSF	005323M		Norborne	Oak St.	Circuitry Upgrade	\$100,000
Chariton	BNSF	005264M		Marceline	County Rd. 219	Passive to Active	\$100,000
Chariton	NS	483757R		Keytesville	Keytesville Sta. St.	Passive to Active	\$100,000
Macon	BNSF	005089Y		LaPlata	Owensby St.	Circuitry Upgrade	\$100,000
Randolph	NS	483705Y		Moberly	Singer/CR 167	Passive to Active	\$100,000
Saline	GWR	293436J		Gilliam	Gilliam Cambridge St.	Passive to Active	\$100,000
Saline	GWR	293437H		Gilliam	East St.	Close Crossing	\$ 15,000
Saline	GWR	293438X		Gilliam	Route M/Bartlett St.	Device Upgrade	<u>\$100,000</u>
Subtotal							\$965,000

County	RR	Crossings	MPO	District 3: City	Roadway	Improvement	Estimate
Audrain	NS	483619C		Martinsburg	Cedar St	Device Upgrade	\$100,000
Audrain	NS	483620W		Martinsburg	Walnut St.	Device Upgrade	\$ 90,000
Audrain	NS	483622K		Martinsburg	Route N/Fourth St.	Device Upgrade	\$110,000
Montgomery	NS	483571C		Jonesburg	County Rd. 253	Passive to Active	\$ 90,000
Montgomery	NS	483577T		Jonesburg	County Rd. 256	Passive to Active	\$ 90,000
Montgomery	NS	483578A		Jonesburg	Route Y	Device Upgrade	\$ 90,000
Montgomery	NS	483582P		High Hill	I-70 Outer Rd.	Device Upgrade	\$110,000
Montgomery	NS	483583W		High Hill	County Rd. 238	Passive to Active	\$108,000
Montgomery	NS	483584D		High Hill	Route F	Device Upgrade	\$100,000
Montgomery	NS	483587Y		High Hill	County Rd. 233	Passive to Active	\$135,000
Montgomery	NS	483606B		Montgomery City	County Rd. 177	Passive to Active	\$ 85,000
Montgomery	NS	483607H		Wellsville	County Rd. 185	Passive to Active	\$ 85,000
Montgomery	NS	483612E		Wellsville	Second St.	Device Upgrade	\$100,000
Montgomery	NS	483613L		Wellsville	Route ZZ/Madison	Device Upgrade	\$105,000
Shelby	BNSF	072693W		Hunnewell	First St.	Close Crossing	\$ 15,000
Shelby	BNSF	072694D		Hunnewell	Route V/Center St.	Circuitry Upgrade	\$100,000
Shelby	BNSF	072695K		Hunnewell	Second St.	Close Crossing	\$ 15,000
Warren	NS	483545M		Wright City	Route H	Device Upgrade	\$ 90,000

**List 1: Rail-Highway Crossing Projects In The Construction Phase (Cont.)
Implementation Ordered**

District 3: (Cont.)

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Warren	NS	483547B		Wright City	Strack Church St.	Passive to Active	\$100,000
Warren	NS	483548H		Truesdale	Franklin Rd.	Passive to Active	\$ 90,000
Warren	NS	483554L		Warrenton	Walker Rd.	Passive to Active	\$110,000
Warren	NS	483556A		Truesdale	Laura St.	Circuitry Upgrade	\$ 55,000
Warren	NS	483559V		Warrenton	Troy Rd.	Device Upgrade	\$ 90,000
Warren	NS	483560P		Warrenton	E. Market St.	Device Upgrade	\$ 90,000
Warren	NS	483563K		Warrenton	Sunnyside Rd.	Passive to Active	\$100,000
Warren	NS	483566F		Pendleton	Route B	Device Upgrade	\$112,000
Warren	NS	483568U		Pendleton	Scudder Ranch Rd.	Passive to Active	<u>\$ 90,000</u>
Subtotal							<u>\$2,455,000</u>

District 4:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Lafayette	GWR	293519X		Higginsville	Shelby St.	Passive to Active	\$100,000
Lafayette	GWR	293520S		Higginsville	Bus. 13/Main St.	Device Upgrade	\$100,000
Lafayette	GWR	293521Y		Higginsville	Walnut St.	Device Upgrade	\$100,000
Lafayette	GWR	293522F		Higginsville	Locust St.	Close Crossing	\$100,000
Lafayette	GWR	293564S		Bates City	McDaniel Dr.	Passive to Active	\$100,000
Platte	BNSF	095361S		E. Leavenworth	Kisker Rd.	Passive to Active	\$100,000
Ray	BNSF	069188Y		Thiehoff	Lake Rd	Passive to Active	<u>\$100,000</u>
Subtotal							<u>\$700,000</u>

District 5:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Pettis	UP	442104C		Sedalia	Oak Grove Rd.	Device Upgrade	\$100,000
Pettis	UP	442105J		Sedalia	State Fair Blvd.	Circuitry Upgrade	\$100,000
Pettis	UP	442113B		Sedalia	Park Ave.	Circuitry Upgrade	\$215,000
Pettis	UP	442115P		Sedalia	N. Quincy St.	Close Crossing	\$ 15,000
Pettis	UP	442120L		Sedalia	Prospect St.	Close Crossing	\$ 15,000
Pettis	UP	442121T		Sedalia	Grand Ave.	Circuitry Upgrade	\$100,000
Pettis	UP	442123G		Sedalia	Missouri Ave.	Circuitry Upgrade	\$230,000
Pettis	UP	442124N		Sedalia	Moniteau Ave.	Circuitry Upgrade	\$100,000
Pettis	UP	442128R		Sedalia	MO 765/Ohio St.	Circuitry Upgrade	\$230,000
Pettis	UP	442129X		Sedalia	Lamine Ave.	Close Crossing	\$ 15,000

**List 1: Rail-Highway Crossing Projects In The Construction Phase (Cont.)
Implementation Ordered**

District 5: (Cont.)

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Pettis	UP	442141E		Sedalia	Engineer Ave.	Circuitry Upgrade	\$215,000
Pettis	UP	442144A		Sedalia	Emmet St.	Circuitry Upgrade	\$130,000
Pettis	UP	442146N		Sedalia	Harding Ave.	Circuitry Upgrade	\$115,000
Pettis	UP	442157B		Smithton	Spur 50/Washington	Circuitry Upgrade	<u>\$100,000</u>
Subtotal							\$1,680,000

District 6:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
St. Charles	NS	483495L	St. Louis	St. Charles	Elm Point Rd.	Close Crossing	\$100,000
St. Charles	NS	483506W	St. Louis	O'Fallon	Cool Springs Rd.	Passive to Active	\$ 95,000
St. Charles	NS	483511T	St. Louis	O'Fallon	Elaine St.	Passive to Active	\$ 95,000
St. Charles	NS	483512A	St. Louis	O'Fallon	Genteman Rd.	Circuitry Upgrade	\$ 85,000
St. Charles	NS	483527P	St. Louis	Wentzville	Wilmer Rd.	Device Upgrade	\$110,000
St. Charles	NS	483539J	St. Louis	Foristell	Seeger Lane	Passive to Active	\$125,000
St. Charles	NS	916957A	St. Louis	St. Charles	Zumbuhl Rd.	Passive to Active	\$100,000
St. Louis	NS	480292W	St. Louis	Berkeley	McDonnell Blvd.	Circuitry Upgrade	\$ 63,000
St. Louis City	UP	424963T	St. Louis	St. Louis	Sublette Ave.	Circuitry Upgrade	\$ 93,000
St. Louis City	NS	480232M	St. Louis	St. Louis	Park Lane	Device Upgrade	\$ 95,000
St. Louis City	NS	480235H	St. Louis	St. Louis	Goodfellow St.	Circuitry Upgrade	<u>\$ 85,000</u>
Subtotal							\$1,046,000

District 7:

County	RR	Crossings	MPO	City	Roadway	Improvements	Estimate
Jasper	KCS	330013L		Asbury	Route CC	Circuitry Upgrade	\$ 50,000
Jasper	KCS	330014T		Asbury	Main St.	Passive to Active	\$100,000
Jasper	KCS	330028B		Waco	Kafir Rd.	Passive to Active	\$100,000
Jasper	KCS	330029H		Waco	N. Roney St.	Close Crossing	\$ 50,000
Jasper	KCS	330039N	Joplin	Joplin	Elk Rd.	Device Upgrade	\$100,000
Jasper	MNA	434798M		Carthage	County Rd. 170	Passive to Active	\$100,000
Jasper	BNSF	668242T	Joplin	Carl Junction	Route Z/Roney St.	Passive to Active	<u>\$100,000</u>
Subtotal							\$600,000

**List 1: Rail-Highway Crossing Projects In The Construction Phase (Cont.)
Implementation Ordered**

District 8:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Greene	BNSF	669804P		Ash Grove	Farm Rd. 84	Passive to Active	\$100,000
Wright	BNSF	667683M		Mansfield	County Rd. 533	Passive to Active	<u>\$100,000</u>
Subtotal							\$200,000
District 9:							
County	RR	Crossings	MPO	City	Roadway	Improvements	Estimate
Crawford	BNSF	664394B		Cuba	McPherson/CR 534	Passive to Active	\$100,000
Phelps	BNSF	664574Y		St. James	County Rd. 3610	Passive to Active	<u>\$100,000</u>
Subtotal							\$200,000
District 10:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Pemiscot	BNSF	665520W		Holland	County Rd.	Close Crossing	\$ 15,000
Pemiscot	BNSF	665521D		Holland	Route F/Walnut St.	Device Upgrade	\$100,000
Pemiscot	BNSF	665522K		Holland	First St.	Close Crossing	\$ 15,000
Ste. Genevieve	UP	371438M		Weingarten	Route 32	Circuitry Upgrade	\$100,000
Stoddard	UP	789105V		Dexter	County Rd. 533	Close Cross.-Build Rdwy	\$100,000
Stoddard	UP	789107J		Dexter	County Rd. 527	Passive to Active	<u>\$100,000</u>
Subtotal							\$430,000
Total							<u>\$8,276,000</u>

**List 2: Rail-Highway Crossing Projects In The Design Phase
Anticipated Implementation In FY 2001**

District 1:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the design phase.							

District 2:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Linn	BNSF	005129U		Bucklin	E. 5th St.	Close Crossing	\$ 50,000
Linn	BNSF	005130N		Bucklin	Third St.	Circuitry Upgrade	\$100,000
Linn	BNSF	005132C		Bucklin	Santa Fe Ave.	Circuitry Upgrade	<u>\$100,000</u>
Subtotal							<u>\$250,000</u>

District 3:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the design phase.							

District 4:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Clay	UP	605516T		Mosby	MO Route 92	Device Upgrade	\$130,000
Jackson	GWR	293584D	Kansas City	Blue Springs	10th St.	Circuitry Upgrade	\$100,000
Jackson	GWR	293585K	Kansas City	Blue Springs	Main St.	Device Upgrade	\$100,000
Jackson	GWR	293587Y	Kansas City	Blue Springs	Woods Chapel Rd.	Device Upgrade	\$100,000
Ray	BNSF	005352X		Camden	Missouri St.	Device Upgrade	\$100,000
Ray	NS	483848W		Camden	Missouri St.	Device Upgrade	<u>\$100,000</u>
Subtotal							<u>\$630,000</u>

District 5:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the design phase.							

List 2: Rail-Highway Crossing Projects In The Design Phase (Cont.)
Anticipated Implementation In FY 2001

District 6:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
St. Charles	BNSF	068792M	St. Louis	Seeburger	Blase Station Rd.	Circuitry Upgrade	\$100,000
St. Louis City	NS	480221A	St. Louis	St. Louis	E. Grand Ave.	Circuitry Upgrade	\$100,000
St. Louis City	TRRA	803345P	St. Louis	St. Louis	E. Grand Ave.	Circuitry Upgrade	\$100,000
St. Louis City	MRS	854665E	St. Louis	St. Louis	Dorcas @ Broadway	Circuitry Upgrade	<u>\$115,000</u>
Subtotal							<u>\$415,000</u>

District 7:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Lawrence	MNA	435105S		Aurora	Route K	Circuitry Upgrade	\$100,600
Lawrence	BNSF	673311J		Aurora	Route K	Circuitry Upgrade	\$100,600
Lawrence	BNSF	673312R		Aurora	McNatt St.	Circuitry Upgrade	\$100,600
Lawrence	BNSF	673313X		Aurora	Morgan St.	Circuitry Upgrade	<u>\$100,600</u>
Subtotal							<u>\$402,400</u>

District 8:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the design phase.							

District 9:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the design phase.							

District 10:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Butler	UP	446259H		Poplar Bluff	Second St.	Device Upgrade	\$100,000
Butler	UP	446260C		Poplar Bluff	B St.	Grade Separation	\$250,000
Butler	UP	446262R		Poplar Bluff	C St.	Close Crossing	\$ 15,000
Dunklin	UP	787950U		Malden	Broadwater St.	Circuitry Upgrade	\$100,000
Dunklin	UP	787951B		Malden	Francis St.	Circuitry Upgrade	<u>\$100,000</u>
Subtotal							<u>\$565,000</u>

Total

\$2,262,400

**List 3: 1998 Funded Rail-Highway Crossing Projects In The Preliminary Design Phase
Anticipated Implementation In FY 2002**

District 1:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in this phase.							
District 2:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Chariton	BNSF	005263F		Marceline	County Rd. 223	Passive to Active	\$100,000
Grundy	UP	605576C		Trenton	18th St.	Close Crossing	\$ 15,000
Grundy	UP	605676G		Trenton	Mable St.	Passive to Active	\$100,000
Macon	BNSF	005095C		LaPlata	County Rd.519B	Passive to Active	<u>\$100,000</u>
Subtotal							\$315,000
District 3:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Lincoln	BNSF	072869E		Winfield	Route N	Device Upgrade	\$100,000
Montgomery	NS	483597E		Montgomery City	Mitchell Rd.	Close Crossing	\$ 0
Montgomery	NS	916969U		Montgomery City	Niedergerke Dr.	Passive to Active	\$200,000
Montgomery	NS	483598L		Montgomery City	Walker St.	Device Upgrade	\$200,000
Montgomery	NS	483599T		Montgomery City	Spinsby St.	Circuitry Upgrade	\$100,000
Montgomery	NS	483602Y		Montgomery City	Third St.	Close Crossing	\$ 0
Montgomery	NS	483603F		Montgomery City	Seventh St.	Device Upgrade	\$100,000
Montgomery	NS	483604M		Montgomery City	Route B	Device Upgrade	\$100,000
Pike	BNSF	078439P		Louisiana	South Carolina St.	Passive to Active	\$100,000
Pike	BNSF	078440J		Louisiana	Georgia St.	Device Upgrade	\$100,000
Shelby	BNSF	072704G		Shelbina	Sixth St.	Device Upgrade	\$100,000
Shelby	BNSF	072714M		Clarence	East St.	Close Crossing	\$ 15,000
Shelby	BNSF	072715U		Clarence	MO 151/Shelby St.	Device Upgrade	\$100,000
Shelby	BNSF	072718P		Clarence	Grand St.	Circuitry Upgrade	\$100,000
Shelby	BNSF	072720R		Clarence	First St.	Close Crossing	<u>\$ 15,000</u>
Subtotal							\$1,330,000
District 4:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Jackson	KCS	329740T	Kansas City	Kansas City	N. Kansas Ave	Circuitry Upgrade	\$100,000
Jackson	UP	422984E	Kansas City	Kansas City	Holmes Rd.	Circuitry Upgrade	\$100,000
Jackson	UP	441948K	Kansas City	Independence	35th St.	Device Upgrade	\$200,000
Johnson	UP	442070K		Knob Noster	Route J/N /State St.	Device Upgrade	\$130,000
Johnson	UP	442072Y		Knob Noster	Adams St.	Circuitry Upgrade	\$100,000
Ray	BNSF	005340D		Henrietta	County Rd. 307	Passive to Active	<u>\$100,000</u>
Subtotal							\$780,000

**List 3: 1998 Funded Rail-Highway Crossing Projects In The Preliminary Design Phase
Anticipated Implementation In FY 2002**

District 5:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Moniteau	UP	442186L		Dow	Claas Crossing Dr.	Passive to Active	\$100,000

District 6:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Jefferson	UP	446451M	St. Louis	Desoto	County Road	Passive to Active	\$100,000
Jefferson	BNSF	663848U	St. Louis	Arnold	Arnold-Tenbrook	Device Upgrade	\$100,000
St. Louis City	UP	424882T	St. Louis	St. Louis	Germania	Device Upgrade	\$ 50,000
St. Louis City	MRS	854661C	St. Louis	St. Louis	Pestalozy Busch St.	Circuitry Upgrade	\$100,000
St. Louis City	MRS	854664X	St. Louis	St. Louis	Dorcas Busch Pl.	Circuitry Upgrade	<u>\$100,000</u>
Subtotal							\$450,000

District 7:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Barry	BNSF	668316H		Monett	Eisenhower St.	Grade Separation	\$300,000
Barry	BNSF	673367D		Monett	Central Ave.	Close Crossing	\$100,000
Jasper	MNA	434987K	Joplin	Webb City	Atlas St.	Passive to Active	\$100,000
Lawrence	BNSF	673302K		Marionville	Lincoln St.	Close Crossing	\$ 15,000
Lawrence	BNSF	673304Y		Marionville	Odell St.	Close Crossing	\$ 15,000
Lawrence	BNSF	673305F		Marionville	Central Ave.	Device Upgrade	\$125,000
Lawrence	BNSF	673306M		Marionville	Western Ave.	Device Upgrade	<u>\$125,000</u>
Subtotal							\$780,000

District 8:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Christian	BNSF	673300W		Marionville	County Rd.	Passive to Active	\$100,000
Greene	BNSF	664100N	Springfield	Springfield	Packer Rd.	Device Upgrade	\$100,000
Greene	BNSF	673273C	Springfield	Republic/Brookl.	County Rd.	Passive to Active	\$100,000
Greene	BNSF	673275R		Republic	Farm Rd. 170	Passive to Active	\$100,000
Greene	BNSF	673283H		Republic	Farm Rd. 194	Passive to Active	\$100,000
Webster	BNSF	667628M		Fordland	County Rd.	Passive to Active	\$100,000
Webster	BNSF	667664P		Seymour	County Rd. 301	Close Crossing	\$ 0
Webster	BNSF	667667D		Seymour	County Rd. 303	Passive to Active	\$150,000
Webster	BNSF	673249P		Strafford	County Rd. 469	Close Crossing	\$ 0
Webster	BNSF	673250V		Strafford	County Rd. 467	Passive to Active	\$200,000
Webster	BNSF	673251C		Strafford	Farm Rd. 104	Close Crossing	<u>\$ 0</u>
Subtotal							\$950,000

**List 3: 1998 Funded Rail-Highway Crossing Projects In The Preliminary Design Phase
Anticipated Implementation In FY 2002**

District 9:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the preliminary design phase.							
District 10:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Pemiscot	BNSF	665541P		Hayti	Cleveland St.	Passive to Active	\$100,000
Stoddard	UP	789070W		Painton	Route O	Circuitry Upgrade	<u>\$100,000</u>
Subtotal							<u>\$200,000</u>
Total							<u>\$4,755,000</u>

**List 4: 1999 Funded Rail-Highway Crossings In The Preliminary Design Phase
Anticipated Implementation In FY 2003**

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the preliminary design phase.							

District 2:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Carroll	BNSF	005290C		Bosworth	County Rd. 223	Passive to Active	\$100,000
Macon	BNSF	005094V		LaPlata	County Rd. 515	Passive to Active	\$100,000
Randolph	NS	480731D		Moberly	Gratz-Brown St.	Passive to Active	\$100,000
Randolph	NS	480734Y		Moberly	Ault St.	Passive to Active	\$100,000
Randolph	NS	483690L		Moberly	Pig & Bun Rd.	Passive to Active	<u>\$100,000</u>
Subtotal							\$500,000

District 3:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Knox	BNSF	005063W		Baring	County Rd.	Passive to Active	\$100,000
Marion	NS	480629X		Near Rensselaer	County Rd. 431	Passive to Active	\$100,000
Shelby	BNSF	072702T		Shelbina	Fourth St.	Device Upgrade	<u>\$100,000</u>
Subtotal							\$300,000

District 4:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Cass	UP	441983Y	Kansas City	Pleasant Hill	175th St.	Passive to Active	\$100,000
Jackson	UP	441942U	Kansas City	Independence	South Ave.	Circuitry Upgrade	\$100,000
Johnson	UP	442068J		Montserrat	County Rd.	Passive to Active	\$100,000
Ray	BNSF	005359V		Orrick	County Rd.	Passive to Active	\$100,000
Ray	IMRL	375486R		Lawson	Garner St.	Passive to Active	<u>\$100,000</u>
Subtotal							\$500,000

District 5:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
No projects in the preliminary design phase.							

**List 4: 1999 Funded Rail-Highway Crossings In The Preliminary Design Phase
Anticipated Implementation In FY 2003**

District 6:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Franklin	BNSF	664343R	St. Louis	Pacific	Greditzer Dr.	Passive to Active	\$100,000
Franklin	BNSF	664376D	St. Louis	St. Clair	County Rd.	Passive to Active	<u>\$100,000</u>
Subtotal							\$200,000

District 7:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Barton	BNSF	669998U		Lamar	Gulf St.	Device Upgrade	\$100,000
Lawrence	BNSF	668319D		Pierce City	County Rd.	Passive to Active	\$100,000
Newton	KCS	330099X		Neosho	Sherman Ave.	Close Crossing	\$ 0
Newton	KCS	330102D		Neosho	Bus. 60/College St.	Device Upgrade	\$100,000
Newton	KCS	330103K		Neosho	Morrow St.	Close Cross.-Build Rdwy	\$100,000
Newton	KCS	330104S		Neosho	Wood St.	Close Crossing	\$ 0
Newton	KCS	330105Y		Neosho	Coler St.	Close Crossing	\$ 0
Newton	KCS	330112J		Neosho	Spring St.	Device Upgrade	\$100,000
Newton	KCS	330113R		Neosho	Mo 86/McKinney St.	Device Upgrade	\$100,000
Newton	KCS	330114X		Neosho	Park St.	Device Upgrade	\$100,000
Newton	BNSF	668369G		Neosho	Washington St.	Close Cross.-Build Rdwy	\$100,000
Newton	BNSF	668370B		Neosho	Baxter St.	Device upgrade	<u>\$100,000</u>
Subtotal							\$900,000

District 8:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Greene	BNSF	664099W	Springfield	Springfield	Packer Rd.	Device Upgrade	\$100,000
Greene	BNSF	664103J	Springfield	Springfield	Pythian St.	Device Upgrade	\$100,000
Greene	BNSF	664105X	Springfield	Springfield	Catalpa St.	Device Upgrade	\$100,000
Greene	BNSF	664262R	Springfield	Springfield	U.S. 60/U.S. 65	Lighting	\$100,000
Greene	BNSF	673252J		Strafford	Farm Rd. 249	Passive to Active	\$100,000
Webster	BNSF	673220D		Niangua	Route M	Device Upgrade	<u>\$100,000</u>
Subtotal							\$600,000

**List 4: 1999 Funded Rail-Highway Crossings In The Preliminary Design Phase
Anticipated Implementation In FY 2003**

District 9:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Howell	BNSF	667842S		Pomona	County Rd. 154	Passive to Active	\$100,000
Texas	BNSF	667722B		Cabool	CR 5930/Cannaday St	Close Crossing	\$ 0
Texas	BNSF	667726D		Cabool	Cedar St.	Close Crossing	\$ 0
Texas	BNSF	667862D		Cabool	Walnut St.	Close Cross.-Build Rdwy	\$200,000
Texas	BNSF	667864S		Cabool	Airport Rd.	Passive to Active	\$ 0
Washington	UP	446429A		Mineral Point	Rainbow Springs Rd.	Passive to Active	<u>\$100,000</u>
Subtotal							<u>\$400,000</u>

District 10:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
New Madrid	BNSF	665570A		Portageville	Sixth St.	Passive to Active	\$100,000
New Madrid	BNSF	665591T		Lilbourn	Phillips Ave.	Passive to Active	\$100,000
Perry	BNSF	663936E		McBride	Main St.	Passive to Active	\$100,000
Scott	BNSF	665642B		Oran	Greer St.	Passive to Active	\$100,000
Scott	BNSF	665643H		Oran	Route W/Radcliff St.	Device Upgrade	<u>\$100,000</u>
Subtotal							<u>\$500,000</u>

Total	<u>\$3,900,000</u>
-------	--------------------

**List 5: Additional Rail-Highway Crossing Projects To Be Funded In Fiscal Year 2000
Anticipated Implementation In FY 2004**

County	RR	Crossings	MPO	District 1: City	Roadway	Improvement	Estimate
No additional projects to be funded.							

County	RR	Crossings	MPO	District 2: City	Roadway	Improvement	Estimate
Carroll	BNSF	005311T		Carrollton	County Rd. 636	Passive to Active	\$130,000
Chariton	NS	483753N		Keytesville	County Rd. 425	Passive to Active	\$130,000
Randolph	NS	483677X		Clark	County Rd. 242	Passive to Active	\$130,000
Randolph	NS	483678E		Clark	Route P/Main St.	Device Upgrade	\$130,000
Randolph	NS	483687D		Moberly	Prison Rd.	Device Upgrade	\$130,000
Randolph	NS	483689S		Moberly	Urbandale Rd.	Circuitry Upgrade	\$130,000
Randolph	NS	483691T		Moberly	McKinsey St.	Circuitry Upgrade	\$130,000
Randolph	NS	483694N		Moberly	Carpenter St.	Device Upgrade	\$130,000
Randolph	NS	483695V		Moberly	Wrightman St.	Device Upgrade	<u>\$130,000</u>
Subtotal							\$1,170,000

County	RR	Crossings	MPO	District 3: City	Roadway	Improvement	Estimate
Audrain	GWWR	293344W		Mexico	Morris St.	Device Upgrade	\$130,000
Audrain	NS	483626M		Benton City	County Rd. 531	Passive to Active	\$130,000
Audrain	NS	483630C		Benton City	Route A	Device Upgrade	\$130,000
Audrain	NS	483633X		Benton City	County Rd.	Passive to Active	\$130,000
Audrain	NS	483643D		Mexico	Morris St.	Device Upgrade	\$130,000
Audrain	NS	483645S		Mexico	County Rd. 929	Passive to Active	\$130,000
Audrain	NS	483646Y		Mexico	County Rd. 935	Passive to Active	\$130,000
Audrain	NS	483648M		Thompson	Main St.	Device Upgrade	\$130,000
Audrain	NS	483649U		Thompson	County Rd. 951	Passive to Active	\$130,000
Audrain	NS	483650N		Thompson	County Rd. 957	Passive to Active	\$130,000
Audrain	NS	483652C		Thompson	County Rd. 963	Passive to Active	\$130,000
Audrain	NS	483654R		Thompson	County Rd. 973	Passive to Active	\$130,000
Marion	BNSF	063537L		Hannibal	Route JJ	Device Upgrade	<u>\$130,000</u>
Subtotal							\$1,690,000

List 5: Additional Rail-Highway Crossing Projects To Be Funded In Fiscal Year 2000 (Cont.)
Anticipated Implementation In FY 2004

District 4:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Jackson	BNSF	663534X	Kansas City	Kansas City	St. Louis St.	Passive to Active	\$130,000
Jackson	BNSF	663541H	Kansas City	Kansas City	Genessee St.	Device Upgrade	\$130,000
Johnson	UP	442085A		Knob Noster	Route FF	Circuitry Upgrade	\$130,000
Platte	BNSF	095197R		Armour	Stanton Rd.	Passive to Active	\$130,000
Ray	BNSF	005345M		Henrietta	County Rd. 319	Passive to Active	\$130,000
Ray	BNSF	005347B		Camden	County Rd. 320	Passive to Active	<u>\$130,000</u>
Subtotal							\$780,000

District 5:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Boone	NS	483657L		Centralia	County Rd. 989	Passive to Active	\$130,000

District 6:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
St. Louis	BNSF	663842D	St. Louis	Lemay	Ringer Rd.	Device Upgrade	\$130,000

District 7:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Jasper	MNA	434841R	Joplin	Webb City	Zora St.	Passive to Active	\$130,000
Lawrence	BNSF	673309H		Aurora	County Rd.	Passive to Active	\$130,000
Vernon	MNA	443129B		Nevada	Murphy Farms Rd.	Passive to Active	<u>\$130,000</u>
Subtotal							\$390,000

District 8:

County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Webster	BNSF	667650A		Diggins	Route NN	Device Upgrade	\$130,000
Webster	BNSF	667653V		Diggins	Short Rd.	Passive to Active	<u>\$130,000</u>
Subtotal							\$260,000

List 5: Additional Rail-Highway Crossing Projects To Be Funded In Fiscal Year 2000 (Cont.)
Anticipated Implementation In FY 2004

District 9:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
Howell	BNSF	667847B		Pomona	County Rd. 5120	Passive to Active	\$130,000
District 10:							
County	RR	Crossings	MPO	City	Roadway	Improvement	Estimate
New Madrid	BNSF	665566K		Portageville	Main & Second	Device Upgrade	\$130,000
New Madrid	UP	446328N		Dexter	Route ZZ	Device Upgrade	\$130,000
Stoddard	UP	446340V		Dexter	Locust St.	Device Upgrade	<u>\$130,000</u>
Subtotal							<u>\$390,000</u>
Total							<u>\$5,700,000</u>

Railroad Company Glossary

BNSF - The Burlington Northern and Santa Fe Railway Company

GWWR - Gateway Western Railway Company (*Now part of Kansas City Southern Railway Company*)

IMRL - I & M Rail Link

KCS - Kansas City Southern Railway Company

MNA - Missouri And Northern Arkansas Railroad Company

MRS - Manufacturer's Railway Company

NS - Norfolk Southern Railway

TRRA - Terminal Railroad Association of St. Louis

UP - Union Pacific (*Includes Missouri Pacific and Southern Pacific*)

IMPROVEMENT TYPE DEFINITIONS

Circuitry Upgrade (C.U.), Upgrade present circuitry to constant warning time circuitry

Close Crossing, Install barricades and necessary work to close/remove existing crossings

Device Upgrade (D. U.), Same as circuitry upgrade plus the addition of gates at crossings

Grade Separation, Construct grade separation structure to eliminate conflicts at crossings

New Surface, Install new rubberized or other surface at crossings to reduce roughness

Passive to Active (P to A), Installation of warning devices, flashing light signals and gates at crossings which currently have only passive warning devices (*i.e. crossbucks*)

Exposure INDEX Computation Procedure

The **Exposure Index (EI)** is a two part equation. The first is a relationship of train-vehicular characteristics called a "Traffic Index Factor". The second is a relationship of "Required-to-Actual" highway approach sight distances called a "Sight Distance Factor".

TRAFFIC INDEX FACTOR

The **Traffic Index (TI)** is the major component of this **Exposure Index**. It is determined as follows:

$$TI = (T) (Ts) (V) (Vs) \text{ (10-4)}$$

where;

- T = number of daily train movements
- Ts = maximum allowable train speed
- V = average daily traffic count
- Vs = normal vehicular operating speed *

SIGHT DISTANCE FACTOR

The **Required Sight Distance (RSD)** used are found in Table 20 "*Required Design Sight Distances - --*" as extracted from Highway Research Board *Report 50* .

To calculate the **Sight Distance Obstructions (SDO)**, ** subtract the **Actual Sight Distance** from the **Required Sight Distance**. **Percent of Obstruction (P)** is determined by dividing the **Sight Distance Obstruction** by the **Required Sight Distance**.

$$PO = SDO/RSD$$

The **Percent of Obstruction** is multiplied by the **Traffic Index Factor** to obtain the **Sight Distance Factor**.

$$PO(TI)$$

Exposure Index

Exposure Index (EI) is computed by totaling the **Traffic Index Factor** and the **Sight Distance Factor**.

$$EI = TI + PO(TI)$$

* *Not to exceed posted maximum allowable speed*

** *An obstruction is included in the Sight Distance Obstruction only if it occurs within the area of the Required Sight Distance*

Revised

